

### Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Date of issue: 09/10/2016 Revision date: 09/10/2016 Version: 1.1

#### **SECTION 1: Identification**

1.1. Identification

Product form : Mixture

Name : Multi-Element Solution 4 - 10 components; 10mg/l each of Au; Hf; Ir; Pd; Rt; Ru; Sb;

Sn; Te in HNO3 5% Equivalent to Perkin Elmer Ref: N9300234

Product code : EQ0209

#### 1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Certified reference material for laboratory use

#### 1.3. Details of the supplier of the safety data sheet

#### Spectracer UK Ltd.

Second Floor, 27 Gloucester Place, London, W1U 8HU, United Kingdom.

Tel: +44 (0) 207 193 9114 Fax:+44 (0) 203 432 4686 Email: contact@spectracer.co.uk Web: www.spectracer.com

#### 1.4. Emergency telephone number

Emergency number : Tel: +44(0)1933445260 Option 1. Language: English only.

For Chemical Emergencies Only Llewellyn (Safety Advisors) Europe Ltd

#### SECTION 2: Hazard(s) identification

#### 2.1. Classification of the substance or mixture

#### **GHS-US** classification

Corrosive to metals H290

Category 1

Skin corrosion/irritation H314

Category 1A

Full text of H statements : see section 16

#### 2.2. Label elements

#### **GHS-US** labeling

Hazard pictograms (GHS-US)



GHS05

Signal word (GHS-US) : Danger

Hazard statements (GHS-US) : H290 - May be corrosive to metals

H314 - Causes severe skin burns and eye damage

Precautionary statements (GHS-US) : P234 - Keep only in original container

P260 - Do not breathe dust/fume/gas/mist/vapors/spray

P280 - Wear protective gloves/protective clothing/eye protection/face protection P301+P330+P331 - If swallowed: rinse mouth. Do NOT induce vomiting

P303+P361+P353 - If on skin (or hair): Take off immediately all contaminated clothing. Rinse

skin with water/shower

P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact

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lenses, if present and easy to do. Continue rinsing P310 - Immediately call a poison center/doctor/... P363 - Wash contaminated clothing before reuse P390 - Absorb spillage to prevent material damage

P405 - Store locked up

P501 - Dispose of contents/container to ...

#### 2.3. Other hazards

No additional information available

#### 2.4. Unknown acute toxicity (GHS US)

Not applicable

#### **SECTION 3: Composition/Information on ingredients**

#### 3.1. Substance

Not applicable

#### 3.2. Mixture

Name	Product identifier	%	GHS-US classification
nitric acid	(CAS No) 7697-37-2	5 - 15	Ox. Liq. 3, H272 Met. Corr. 1, H290 Skin Corr. 1A, H314
rhodium trichloride	(CAS No) 10049-07-7	< 0.1	Acute Tox. 4 (Oral), H302 Skin Irrit. 2, H315 Eye Irrit. 2A, H319 Carc. 2, H351 STOT SE 3, H335
hexafluoroantimonyic acid	(CAS No) 16950-06-4	< 0.1	Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Inhalation), H332 Skin Corr. 1B, H314 Aquatic Chronic 2, H411
iridium(III) chloride	(CAS No) 10025-83-9	< 0.1	Not classified
Hafnium oxide	(CAS No) 12055-23-1	< 0.1	Not classified

Full text of hazard classes and H-statements : see section 16

#### **SECTION 4: First aid measures**

#### 4.1. Description of first aid measures

First-aid measures general : Call a physician immediately.

First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing.

First-aid measures after skin contact : Rinse skin with water/shower. Remove/Take off immediately all contaminated clothing. Call a

physician immediately.

First-aid measures after eye contact : Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to

do. Continue rinsing. Call a physician immediately.

First-aid measures after ingestion : Rinse mouth. Do not induce vomiting. Call a physician immediately.

#### 4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries after skin contact : Burns.

Symptoms/injuries after eye contact : Serious damage to eyes.

Symptoms/injuries after ingestion : Burns.

#### 4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

#### SECTION 5: Firefighting measures

#### 5.1. Extinguishing media

Suitable extinguishing media : Water spray. Dry powder. Foam. Carbon dioxide.

#### 5.2. Special hazards arising from the substance or mixture

Reactivity : The product is non-reactive under normal conditions of use, storage and transport.

#### 5.3. Advice for firefighters

Protection during firefighting : Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing.

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#### **SECTION** 6: Accidental release measures

#### 6.1. Personal precautions, protective equipment and emergency procedures

#### 6.1.1. For non-emergency personnel

Emergency procedures : V

: Ventilate spillage area. Avoid contact with skin and eyes. Do not breathe

dust/fume/gas/mist/vapors/spray.

#### 6.1.2. For emergency responders

Protective equipment

: Do not attempt to take action without suitable protective equipment. For further information

refer to section 8: "Exposure controls/personal protection".

#### 6.2. Environmental precautions

Avoid release to the environment.

#### 6.3. Methods and material for containment and cleaning up

Methods for cleaning up

: Take up liquid spill into absorbent material.

Other information

: Dispose of materials or solid residues at an authorized site.

#### 6.4. Reference to other sections

For further information refer to section 13.

#### SECTION 7: Handling and storage

#### 7.1. Precautions for safe handling

Precautions for safe handling

: Ensure good ventilation of the work station. Avoid contact with skin and eyes. Do not breathe

dust/fume/gas/mist/vapors/spray. Wear personal protective equipment.

Hygiene measures

Wash contaminated clothing before reuse. Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

### 7.2. Conditions for safe storage, including any incompatibilities

Storage conditions

: Store in corrosive resistant container with a resistant inner liner. Keep only in original container.

Store locked up. Store in a well-ventilated place. Keep cool.

Incompatible materials : Metals.

#### SECTION 8: Exposure controls/personal protection

#### 8.1. Control parameters

nitric acid (7697-37-2)			
ACGIH	ACGIH TWA (ppm)	2 ppm	
ACGIH	ACGIH STEL (ppm)	4 ppm	
ACGIH	Remark (ACGIH)	URT & eye irr; dental erosion	
OSHA	OSHA PEL (TWA) (mg/m³)	5 mg/m³	
OSHA	OSHA PEL (TWA) (ppm)	2 ppm	
Hafnium oxide (12055-23-1)	1	1	
ACGIH	ACGIH TWA (mg/m³)	0.5 mg/m³	
ACGIH	Remark (ACGIH)	URT & eye irr; liver dam	
OSHA	OSHA PEL (TWA) (mg/m³)	0.5 mg/m³	
iridium(III) chloride (10025-8	33-9)		
ACGIH	ACGIH TWA (mg/m³)	0.1 mg/m³	
ACGIH	Remark (ACGIH)	Pulm edema; pneumonitis	
rhodium trichloride (10049-07-7)			
ACGIH	ACGIH TWA (mg/m³)	0.01 mg/m³ (Rhodium, Soluble compounds, as Rh; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value)	
Not applicable			

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hexafluoroantimonyic acid (16950-06-4)		
ACGIH	ACGIH TWA (mg/m³)	0.5 mg/m³
ACGIH	Remark (ACGIH)	Skin & URT irr
OSHA	OSHA PEL (TWA) (mg/m³)	0.5 mg/m³

#### 8.2. Exposure controls

Appropriate engineering controls : Ensure good ventilation of the work station.

Personal protective equipment : Avoid all unnecessary exposure. Gloves. Safety glasses. Protective clothing.







Hand protection : Protective gloves. Eye protection : Safety glasses.

Skin and body protection : Wear suitable protective clothing.

Respiratory protection : In case of insufficient ventilation, wear suitable respiratory equipment.

Environmental exposure controls : Avoid release to the environment.

#### SECTION 9: Physical and chemical properties

#### 9.1. Information on basic physical and chemical properties

Physical state : Liquid

Color : Mixture contains one or more component(s) which have the following colour(s):

colorless to yellow On exposure to light: red-brown Golden-yellow to red-yellow white Dark

brown to grey Brown No data available on colour Colourless to light brown White

Odor : There may be no odour warning properties, odour is subjective and inadequate to warn of

overexposure.

Mixture contains one or more component(s) which have the following odour(s):

irritating/pungent odor asphyxiating odor Odorless No data available No data available on

odour

Odor threshold No data available pН No data available Melting point Not applicable Freezing point No data available Boiling point No data available Flash point No data available Relative evaporation rate (butyl acetate=1) : No data available Flammability (solid, gas) : Not applicable. Vapor pressure No data available Relative vapor density at 20 °C : No data available

Relative density : 1.07

Solubility : Miscible with water. : No data available Log Pow Auto-ignition temperature No data available Decomposition temperature : No data available Viscosity, kinematic : No data available : No data available Viscosity, dynamic **Explosion limits** : No data available Explosive properties No data available Oxidizing properties : No data available

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#### 9.2. Other information

No additional information available

#### **SECTION 10: Stability and reactivity**

#### 10.1. Reactivity

The product is non-reactive under normal conditions of use, storage and transport.

#### 10.2. Chemical stability

Stable under normal conditions.

#### 10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

#### 10.4. Conditions to avoid

None under recommended storage and handling conditions (see section 7).

#### 10.5. Incompatible materials

metals.

#### 10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

#### **SECTION 11: Toxicological information**

#### 11.1. Information on toxicological effects

Acute toxicity : Not classified

rnoalum trichloride (10049-07-7)	
LD50 oral rat	1302 mg/kg (Rat)
ATE US (oral)	1302.000 mg/kg body weight
hexafluoroantimonyic acid (16950-06-4)	
ATE US (oral)	500.000 mg/kg body weight
ATE US (gases)	4500.000 ppmV/4h
ATE US (vapors)	11.000 mg/l/4h
ATE US (dust, mist)	1.500 mg/l/4h
Skin corrosion/irritation	Causes severe skin burns and eye damage.

Serious eye damage/irritation : Not classified : Not classified

Respiratory or skin sensitization : Not classified Germ cell mutagenicity : Not classified Carcinogenicity : Not classified : Not classified

Reproductive toxicity : Not classified Specific target organ toxicity (single exposure) : Not classified

Specific target organ toxicity (repeated

exposure)

: Not classified

Aspiration hazard : Not classified

Symptoms/injuries after skin contact : Burns.

Symptoms/injuries after eye contact : Serious damage to eyes.

Symptoms/injuries after ingestion : Burns.

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Bioaccumulative potential

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SECTION 12: Ecological informati	ion
12.1. Toxicity	
Ecology - general	: Before neutralisation, the product may represent a danger to aquatic organisms.
nitric acid (7697-37-2)	
EC50 Daphnia 1	180 mg/l (EC50; 48 h)
LC50 fish 2	72 ppm (LC50; 96 h)
Threshold limit algae 1	> 19 mg/l (EC0)
12.2. Persistence and degradability	
nitric acid (7697-37-2)	Diade weedshills what eastinghin
Persistence and degradability	Biodegradability: Not applicable.
Biochemical oxygen demand (BOD)	Not applicable
Chemical oxygen demand (COD)	Not applicable
ThOD	Not applicable
Hafnium oxide (12055-23-1)	
Persistence and degradability	Not established.
iridium(III) chloride (10025-83-9)	
Persistence and degradability	Biodegradability in soil: Not applicable. Adsorbs into the soil.
Biochemical oxygen demand (BOD)	Not applicable
Chemical oxygen demand (COD)	Not applicable
ThOD	Not applicable
rhodium trichloride (10049-07-7)	'
Persistence and degradability	Biodegradability in soil: Not applicable.
Biochemical oxygen demand (BOD)	Not applicable
Chemical oxygen demand (COD)	Not applicable
ThOD	Not applicable
hexafluoroantimonyic acid (16950-06-4)	
Persistence and degradability	Biodegradability: Not applicable.
Biochemical oxygen demand (BOD)	Not applicable
Chemical oxygen demand (COD)	Not applicable
ThOD	Not applicable  Not applicable
	Not applicable
12.3. Bioaccumulative potential	
nitric acid (7697-37-2)	4 (205)
BCF fish 1	<= 1 (BCF)
Log Pow	-2.3 (OECD 107: Partition Coefficient (n-octanol/water): Shake Flask Method)
Bioaccumulative potential	Bioaccumulation: Not applicable.
Hafnium oxide (12055-23-1)	Not octablished
Bioaccumulative potential iridium(III) chloride (10025-83-9)	Not established.
Bioaccumulative potential	Bioaccumulation: No data available.
·	
rhodium trichloride (10049-07-7) Bioaccumulative potential	Bioaccumulation: No data available.
hexafluoroantimonyic acid (16950-06-4)	
novariation of the first and (10930-00-4)	

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Bioaccumulation: No data available.

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#### 12.4. Mobility in soil

No additional information available

#### 12.5. Other adverse effects

Effect on the global warming : No known effects from this product.

GWPmix comment : No known effects from this product.

#### **SECTION 13: Disposal considerations**

#### 13.1. Waste treatment methods

Waste treatment methods : Dispose of contents/container in accordance with licensed collector's sorting instructions.

Waste disposal recommendations : Dispose in a safe manner in accordance with local/national regulations.

#### **SECTION 14: Transport information**

#### **Department of Transportation (DOT)**

In accordance with DOT

Transport document description : UN3264 Corrosive liquid, acidic, inorganic, n.o.s. (CONTAINS; nitric acid), 8, II

UN-No.(DOT) : UN3264

Proper Shipping Name (DOT) : Corrosive liquid, acidic, inorganic, n.o.s.

CONTAINS; nitric acid

Class (DOT) : 8 - Class 8 - Corrosive material 49 CFR 173.136

: 202

Packing group (DOT) : II - Medium Danger Hazard labels (DOT) : 8 - Corrosive



DOT Packaging Non Bulk (49 CFR 173.xxx)

DOT Packaging Bulk (49 CFR 173.xxx)

DOT Symbols

DOT Special Provisions (49 CFR 172.102)

: 242: G - Identifies PSN requiring a technical name

: B2 - MC 300, MC 301, MC 302, MC 303, MC 305, and MC 306 and DOT 406 cargo tanks are

IB2 - Authorized IBCs: Metal (31A, 31B and 31N); Rigid plastics (31H1 and 31H2); Composite (31HZ1). Additional Requirement: Only liquids with a vapor pressure less than or equal to 110 kPa at 50 C (1.1 bar at 122 F), or 130 kPa at 55 C (1.3 bar at 131 F) are authorized

T11 - 6 178.274(d)(2) Normal...... 178.275(d)(3)

TP2 - a. The maximum degree of filling must not exceed the degree of filling determined by the following: (image) Where: tr is the maximum mean bulk temperature during transport, tf is the temperature in degrees celsius of the liquid during filling, and a is the mean coefficient of cubical expansion of the liquid between the mean temperature of the liquid during filling (tf) and the maximum mean bulk temperature during transportation (tr) both in degrees celsius. b. For liquids transported under ambient conditions may be calculated using the formula: (image) Where: d15 and d50 are the densities (in units of mass per unit volume) of the liquid at 15 C (59 F) and 50 C (122 F), respectively

TP27 - A portable tank having a minimum test pressure of 4 bar (400 kPa) may be used provided the calculated test pressure is 4 bar or less based on the MAWP of the hazardous material, as defined in 178.275 of this subchapter, where the test pressure is 1.5 times the MAWP

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DOT Packaging Exceptions (49 CFR 173.xxx) : 154
DOT Quantity Limitations Passenger aircraft/rail : 1 L

(49 CFR 173.27)

lv (40 · 20 l

DOT Quantity Limitations Cargo aircraft only (49 : 30 L CFR 175.75)

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**DOT Vessel Stowage Location** 

: B - (i) The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or one passenger per each 3 m of overall vessel length; and (ii) "On deck only" on passenger vessels in which the number of passengers specified in paragraph (k)(2)(i) of this section is exceeded

DOT Vessel Stowage Other : 40 - Stow "clear of living quarters"

Emergency Response Guide (ERG) Number : 154

Other information : No supplementary information available.

**TDG** 

Transport document description : UN3264 CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (CONTAINS; nitric acid), 8, II

UN-No. (TDG) : UN3264

Proper Shipping Name (TDG) : CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.

TDG Primary Hazard Classes : 8 - Class 8 - Corrosives
Packing group : II - Medium Danger

**TDG Special Provisions** 

: 16 - (1) The technical name of at least one of the most dangerous substances that predominantly contributes to the hazard or hazards posed by the dangerous goods must be shown, in parentheses, on the shipping document following the shipping name in accordance with clause 3.5(1)(c)(ii)(A) of Part 3 (Documentation). The technical name must also be shown, in parentheses, on a small means of containment or on a tag following the shipping name in accordance with subsections 4.11(2) and (3) of Part 4 (Dangerous Goods Safety Marks). (2) Despite subsection (1), the technical name for the following dangerous goods is not required to be shown on a shipping document or on a small means of containment when Canadian law for domestic transport or an international convention for international transport prohibits the disclosure of the technical name: (a)UN1544, ALKALOID SALTS, SOLID, N.O.S. or ALKALOIDS, SOLID, N.O.S; (b)UN1851, MEDICINE, LIQUID, TOXIC, N.O.S; (c)UN3140, ALKALOID SALTS, LIQUID, N.O.S. or ALKALOIDS, LIQUID, TOXIC, N.O.S; (d)UN3248, MEDICINE, LIQUID, FLAMMABLE, TOXIC, N.O.S; or (e)UN3249, MEDICINE, SOLID, TOXIC, N.O.S. An example in Canada is the "Food and Drugs Act". (3) Despite subsection (1), the technical name for the following dangerous goods is not required to be shown on a small means of

containment: (a)UN2814, INFECTIOUS SUBSTANCE, AFFECTING HUMANS; or (b)UN2900,

INFECTIOUS SUBSTANCE, AFFECTING ANIMALS. SOR/2014-306

Explosive Limit and Limited Quantity Index : 1 L
Passenger Carrying Road Vehicle or Passenger : 1 L

Carrying Railway Vehicle Index

Transport by sea

UN-No. (IMDG) : 3264

Proper Shipping Name (IMDG) : CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.

Class (IMDG) : 8 - Corrosive substances

Packing group (IMDG) : II - substances presenting medium danger

Limited quantities (IMDG) : 1 L

Air transport

UN-No. (IATA) : 3264

Proper Shipping Name (IATA) : Corrosive liquid, acidic, inorganic, n.o.s.

Class (IATA) : 8 - Corrosives
Packing group (IATA) : II - Medium Danger

**SECTION 15: Regulatory information** 

15.1. US Federal regulations

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nitric acid (7697-37-2)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Subject to reporting requirements of United States SARA Section 313	
CERCLA RQ	1000 lb
SARA Section 302 Threshold Planning Quantity (TPQ)	1000 lb

#### Hafnium oxide (12055-23-1)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

#### iridium(III) chloride (10025-83-9)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

#### rhodium trichloride (10049-07-7)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

#### hexafluoroantimonyic acid (16950-06-4)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

#### 15.2. International regulations

#### **CANADA**

No additional information available

#### **EU-Regulations**

No additional information available

#### **National regulations**

No additional information available

### 15.3. US State regulations

No additional information available

### **SECTION 16: Other information**

Revision date : 09/10/2016

Full text of H-phrases:

H272	May intensify fire; oxidizer
H290	May be corrosive to metals
H302	Harmful if swallowed
H314	Causes severe skin burns and eye damage
H315	Causes skin irritation
H319	Causes serious eye irritation
H332	Harmful if inhaled
H335	May cause respiratory irritation
H351	Suspected of causing cancer
H411	Toxic to aquatic life with long lasting effects

NFPA health hazard

: 2 - Intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt

medical attention is given.

NFPA fire hazard : 0 - Materials that will not burn.

NFPA reactivity : 0 - Normally stable, even under fire exposure conditions,

and are not reactive with water.

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**HMIS III Rating** 

Health : 2 Moderate Hazard - Temporary or minor injury may occur

Flammability : 0 Minimal Hazard - Materials that will not burn

Physical : 0 Minimal Hazard - Materials that are normally stable, even under fire conditions, and will NOT

react with water, polymerize, decompose, condense, or self-react. Non-Explosives.

Personal protection : 0

C - Safety glasses, Gloves, Synthetic apron

SDS US (GHS HazCom 2012)

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

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